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crustaceans, young fishes, annelids, etc., may be put up in the sunken cells. Be sure to use colorless Canada Balsam in all cases, or the deeper parts will show yellow.

V. A. L.

HENNING'S SOLUTION FOR FIXING FLIES FOR SECTIONING.

This solution fixes, and softens the chitin. Imbedding should be rapid and brief. The washing should be done with iodised alcohol. Henning's solution:

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|---|----------|
| Nitric Acid (c. p.) | 16 parts |
| Chromic (.5% sol.) | 16 parts |
| Corrosive Sublimate (Sat. sol. in 60% alc.) | 24 parts |
| Abs. Alcohol | 42 parts |
| Picric Acid (saturated watery sol.) | 12 parts |

V. A. L.

ILLINOIS BIOLOGICAL MONOGRAPHS

Under the general series of University Studies the Biological Department of the University of Illinois issues a double number of Volume I of the *Illinois Biological Monographs*. This number is entitled "A Revision of the Cestode Family Proteocephalidæ," by Dr. George R. LaRue. There will be four numbers per volume. The third number of the first volume will be "Studies on the Comparative Anatomy and Phylogeny of the Cestode Family Anoplocephalidæ," by H. Douthitt. Subscription price is \$3.00 yearly. The price of Dr. LaRue's paper is \$2.00. Address Manager University Studies, 321 Natural History Hall, Urbana, Illinois.

REVISION OF THE CESTODE FAMILY PROTEOCEPHALIDÆ.

LaRue (Ill. Biol. Monog. Vol. 1, Nos. 1 and 2, 1914) presents a discussion of the Cestodes of the Family Proteocephalidæ, including the genera *Proteocephalus* (29 species), *Choanoscolex* (1 species), *Corallobothrium*, *Crepidobothrium*, (1 species), *Acanthotania*, and *Ophiotania* (1 species). These infest the cold-blooded Vertebrates. They were formerly included in the old genus *Tania*. The chief

genera are *Proteocephalus*, from fishes, and *Ophiotania* from Amphibians and Reptiles.

Proteocephalids have been found in fish in Europe, North and South America, and Africa. The species of each region are peculiar, except one species common to Europe and N. America. Those of Amphibians and Reptiles have been found in North and South America, Australia, Europe, Asia, and Africa. The distribution of each of these seems narrow. None is known to occur on more than one continent.

Five species of *Proteocephalus* occur in different host species of fishes of the same genus. Four cases are known where a species may occur in members of closely allied genera. There is at least one species that may infest fish belonging to widely different families. When species have multiple hosts the host species have a continuous distribution.

The parasitic infestation of the host is determined by the food eaten. The hosts of those cestodes that have multiple hosts are alike in some of the elements of their food supply. This allows a common intermediate host.

The author believes that this family is related to and derived from marine forms of the order Tetraphyllidea. This probability coupled with the fact that this family of parasites is so well represented in fresh water fishes raises an interesting question as to how parasites, demanding as these do an intermediate host, may have evolved from Cestode parasites of marine adaptations. Reference is made to the salmons, eels, and other forms that pass back and forth from salt to fresh water as possible agents. Yet one of the salmon species that has become permanently fresh water has parasites exclusively characteristic of fresh water. This form was clearly unable to establish its marine parasites, if it had any, in the fresh water conditions, and became the host of fresh water parasites. There is no evidence that these types are succeeding in introducing marine parasites into fresh water.

Another possibility is that the intermediate host of some kind, fish or invertebrate, may have made its transition from marine to fresh water. Then some carnivorous fresh water fish with internal conditions sufficiently like those of the original species, host to the

mature Cestode, may have become infested by adopting the new arrivals as food. This alternative seems the more plausible.

The author believes that Amphibians and Reptiles may have become infected by eating fish or invertebrate intermediate hosts containing larvæ Proteocephalids.

OPTIC PROJECTION.

Dr. Simon Henry Gage who for many years has been an active member of this Society and has twice been its President, and his son, Dr. Henry Phelps Gage, are the joint authors of a book, just issued, with the above title. The expressed object of the book is so to place before the intelligent reader the principles of optic projection, accompanied by such simple and careful directions and illustrations, that any one may become sufficiently proficient to get real satisfaction from the practise of the art.

The tremendous growth in the realization of the value of projection in all kinds of educational work and the great advances in the making of projection apparatus make the book most valuable not alone to users of such instruments, but to manufacturers and to general students of optical processes as well. The work has been done with characteristic painstaking and attention to detail. It is a record of a tremendous amount of practical manipulation and experiment with all manner of projection devices. It is safe to predict that it will become a standard reference work and handbook for the people for whom it is intended.

One of the outstanding features of the treatise is its suggestions for adapting and combining parts of standard apparatus for special uses, and thus for making economical combinations and elaborations at home.

This book ought to do much to bring closer together the manufacturer and the user of projection apparatus. The manufacturer must make allowance for the lack of optical and mechanical knowledge and skill on the part of the users, and the user must understand that the best results can only be had by understanding the principles upon which the apparatus is built.

There are fifteen chapters, with appendices, bibliography, etc. The illustrations are abundant. These consist not merely of photo-